BACHELOR OF COMPUTER SCIENCE (COMPUTER NETWORKING)
A bachelor’s degree course in Computer Science, B.Sc. (Computer Networking) (Honours) is aimed to produce highly knowledgeable and skillful graduates in the field of information technology and communication. Graduates are competent in advanced specialized knowledge and skill in analyzing, developing, installing, administrating, servicing, and controlling computer and communication network system.

The aim of FTMK bachelor’s degree program is to produce students with the following characteristics:

1. Able to implement knowledge learnt in Computer Science and Information Technology.
2. Able to analyze, create and develop ICT applications.
3. Able to analyze, create, assemble, configure, implement, manage, maintain and administer network infrastructure and security.
4. Able to develop advance computer network applications.
5. Able to obtain recognition from professional bodies.
6. Able to solve problems critically and creatively, and are able to communicate effectively.
7. Able to contribute individual or group skills in various disciplines and domains.
8. Able to reflect high self esteem, strong ethics, moral values, leadership and entrepreneurship skills.
9. Able to perform continuous self learning to obtain knowledge and skills.
CAREER PROSPECTS

The graduates can be employed in the government and private sectors as well as undertaking business ventures of their own. The positions suitable for the graduates including Information System Executive, System Analyst, Computer Security Executive, Network Project Administrator, Network Programmer and Network Engineer.

CURRICULUM STRUCTURE

The students intended to be awarded an honor Bachelors Degree in Computer Science (Computer Networking) are subjected to complete a minimum of 120 credits from various predetermined program components. Below are the lists of the components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>University Compulsory Subjects</td>
<td>18</td>
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<tr>
<td>Program Core Subjects</td>
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<td>Course Core Subjects</td>
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<td>Elective Subjects</td>
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### UNIVERSITY COMPULSARY SUBJECTS  (18 credits)

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
<td>BLHC 4042</td>
<td>Entrepreneur Skills and New Business</td>
<td>(Kemahiran Keusahawanan dan Perniagaan Baru)</td>
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<tr>
<td>BLHW 1702</td>
<td>Islamic and Asian Civilizations</td>
<td>(Tamadun Islam dan Tamadun Asia –TITAS)</td>
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<tr>
<td>BLHW 2712</td>
<td>Etnique Relation</td>
<td>(Hubungan Etnik)</td>
</tr>
<tr>
<td>BLHW 2402</td>
<td>Technical Communication I</td>
<td>(Komunikasi Teknikal I)</td>
</tr>
<tr>
<td>BLHW 3402</td>
<td>Technical Communication II</td>
<td>(Komunikasi Teknikal II)</td>
</tr>
<tr>
<td>BLHW 1722</td>
<td>Philosophy of Science and Technology</td>
<td>(Falsafah Sains dan Teknologi)</td>
</tr>
<tr>
<td>BLHL 4032</td>
<td>Critical and Creative Thinking</td>
<td>(Pemikiran Kritis dan Kreatif)</td>
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<tr>
<td>BLHW 1012</td>
<td>Foundation English</td>
<td>(Asas Bahasa Inggeris)*</td>
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<td>Third Language</td>
<td>(Bahasa Ketiga)</td>
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### PROGRAMME CORE SUBJECTS  (72 credits)

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<td>Mathematics for Computer Science II</td>
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<td>Statistic and Probability</td>
<td>(Statistik dan Kebarangkalian)</td>
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<td>Programming Technique</td>
<td>(Teknik Pengaturcaraan)</td>
</tr>
<tr>
<td>BITP 1123</td>
<td>Data Structure and Algorithm</td>
<td>(Struktur Data dan Algoritma)</td>
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<tr>
<td>BITP 1213</td>
<td>System Development</td>
<td>(Pembangunan Sistem)</td>
</tr>
<tr>
<td>BITP 1323</td>
<td>Database</td>
<td>(Pangkalan Data)</td>
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<tr>
<td>BITP 3113</td>
<td>Object Oriented Programming</td>
<td>(Pengaturcaraan Berorientasikan Objek)</td>
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<tr>
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<td>Software Engineering</td>
<td>(Kejuruteraan Perisian)</td>
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<td>(Organisasi dan Senibina Komputer)</td>
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<td>(Sistem Pengoperasian)</td>
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<td>(Pembangunan Aplikasi Web)</td>
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<td>(Laporan Latihan Industri)</td>
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**COURSE CORE SUBJECTS** **(24 credits)**

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<td>(Rangkaian Komputer Setempat)</td>
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<tr>
<td>BITS 2323</td>
<td>Wide Area Network</td>
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<td>(Rangkaian Komputer Meluas)</td>
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<tr>
<td>BITS 2333</td>
<td>Network Analysis and Design</td>
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<tr>
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<td>(Analisa dan Rekabentuk Rangkaian)</td>
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<tr>
<td>BITS 3313</td>
<td>Network Administration and Management</td>
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<tr>
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<td>(Pentadbiran dan Pengurusan Rangkaian)</td>
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<tr>
<td>BITS 3323</td>
<td>Network Project Management</td>
</tr>
<tr>
<td></td>
<td>(Pengurusan Projek Rangkaian)</td>
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<tr>
<td>BITS 3333</td>
<td>Multimedia Networking</td>
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<tr>
<td></td>
<td>(Rangkaian Multimedia)</td>
</tr>
<tr>
<td>BITS 3413</td>
<td>IT and Network Security</td>
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<tr>
<td></td>
<td>(Keselamatan Teknologi Maklumat dan Rangkaian)</td>
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<td>BITS 3513</td>
<td>TCP/IP Programming</td>
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<td>(Pengaturcaraan TCP/IP)</td>
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ELECTIVE SUBJECTS  (6 credits)
Choose any two from the following.

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>BITP 2223</td>
<td>Software Design and Requirement</td>
<td>(Keperluan dan Rekabentuk Perisian)</td>
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<td>BITS 3343</td>
<td>Fiber Optic</td>
<td>(Fiber Optik)</td>
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<td>BITM 1123</td>
<td>Interactive Media Authoring</td>
<td>(Pengarangan Media Interaktif)</td>
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<tr>
<td>BITM 2123</td>
<td>Digital Audio and Video Technology</td>
<td>(Teknologi Audio dan Video Digital)</td>
</tr>
<tr>
<td>BITS 2213</td>
<td>Network Operating System</td>
<td>(Sistem Pengoperasian Rangkaian)</td>
</tr>
<tr>
<td>BITS 3533</td>
<td>Wireless Network &amp; Mobile Computing</td>
<td>(Rangkaian Tanpa Wayar dan Pengkomputeran Mudahalih)</td>
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## CURRICULUM STRUCTURE PER SEMESTER

### Year One (Semester I)

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Contact Hours</th>
<th>Credit</th>
<th>Pre-requisite</th>
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<tbody>
<tr>
<td>BLHW 1702</td>
<td>Islamic and Asian Civilizations</td>
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<td>BLHW 1012</td>
<td>Foundation English</td>
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<td>BLHW 1722</td>
<td>Philosophy of Science and Technology</td>
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<td>BITP 1113</td>
<td>Programming Technique</td>
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<td>3</td>
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<td>BITP 1213</td>
<td>System Development</td>
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<td>3</td>
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**TOTAL** 18

### Year One (Semester II)

<table>
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<td>Multimedia System</td>
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**TOTAL** 18

### Year Two (Semester I)

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<td>Object Oriented Programming</td>
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**TOTAL** 18

**This subject can be taken in any semester.**
### Year Two (Semester II)

<table>
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<tbody>
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<td>BITP 2213</td>
<td>Software Engineering</td>
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<td>BITS 2333</td>
<td>Network Analysis and Design</td>
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### Year Three (Semester I)

<table>
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<th>Code</th>
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### Year Three (Semester II)

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<td>TCP/IP Programming</td>
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<td>3</td>
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### Year Three (Special Semester)

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* Equivalent to 9 hours of contact if carried out in normal semester.
### Year Four (Semester I)

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<tr>
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<td>Lab</td>
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<td>BITU 3926</td>
<td>Industrial Training</td>
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<td>Industrial Training Report</td>
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### Elective Subjects

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<td>Lab</td>
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<td>BITP 2223</td>
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<td>BITS 3343</td>
<td>Fiber Optik</td>
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<td>BITM 1123</td>
<td>Interactive Media Authoring</td>
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<td>Digital Audio and Video Technology Sistem Network</td>
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<td>Operating System</td>
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<tr>
<td>BITS 3533</td>
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### Third Language

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BACS 1253  Mathematics for Computer Science I (3,3,2)

Learning Outcomes
Upon completing this course, students should be able to:

1. Explain the concepts of fundamental Linear Algebra and Discrete Mathematic.
2. Solve problems in Computer Science related to Linear Algebra and Discrete Mathematic theory using software.
3. Solve application problems using appropriate techniques.

Synopsis
This course covers two disciplines of mathematics namely Linear Algebra and Discrete Mathematics. The topics for Linear Algebra are linear equations, matrices, determinants, vectors in $\mathbb{R}^n$, real vector spaces, eigenvalues, eigenvectors, diagonalization and linear transformation. The topics for discrete mathematics include logic, sets, function, algorithms, integers, mathematical reasoning, counting, relations, graphs, trees and Boolean algebra.

References

BACS 1263 Mathematics for Computer Science II (3,3,2)

Learning Outcomes
Upon completing this course, students should be able to:

1. Apply the knowledge and basic concepts of calculus and numerical analysis.
2. Solve problems in Computer Science related to calculus and numerical analysis theory using software.
3. Solve application problems using appropriate techniques.

Synopsis
This course covers two disciplines of mathematics namely calculus and numerical analysis. The topics for calculus are derivatives, function, differentiation techniques, logarithmic function and exponents as well as its application, integration techniques, and multivariable functions. The topics for numerical analysis include Taylor polynomial, numbers, error, interpolation, numerical differentiation and integration as well as numerical solution for differential equation.

References

BACS 2213  Statistic and Probability (3,2,2)

Learning Outcomes
Upon completing this subject, students should be able to:
1. Explain the concepts of fundamental statistics and probability.
2. Solve problems in statistic inference related to hypothesis test using software.
3. Solve application problems using appropriate statistic techniques.

**Synopsis**

Students will be introduced to the concept of probability and inferential statistics. The course starts with Probability followed by Discrete Random Variables, Continuous Random Variables and Sampling Distribution. The main topics for Inferential statistics are Estimation, Hypothesis Testing, Estimation and Hypothesis Testing: Two Populations, Anova, Simple Linear Regression and Correlation. This course will also provide the students with some exposure to statistical software.

**References**


**BITP 1113   Programming Technique (3,2,2)**

**Learning Outcomes**

At the end of the lesson, students should be able to:

1. Explain basic principles of problem solving in Software Engineering.
2. Demonstrate basic principles of programming.
3. Develop basic construction of C++ language in building program.

**Synopsis**

This course introduces the students to the basic concepts of computer and programming techniques that includes program lifecycle variable, identifier, data type, operator, selection, repetition, function, array, string, file and pointer.

**References**


**BITP 1123   Data Structure and Algorithm (3,2,2)**

**Learning Outcomes**

At the end of the lesson, students should be able to:

1. Identify suitable data structure for certain application.
2. Solve problems by applying knowledge in data structure and algorithm.
3. Analyze the memory and run time efficiency of an algorithm design.
4. Use and develop data structure based on the current problem requirement.

**Synopsis**

This course introduces the students to data structures and algorithms. The basic concepts in structure, class, array and
pointer are discussed in order to understand the fundamental of data structures and algorithms. The course focuses on data structures such as list, stack, queue, tree, searching and hash while sorting, graph and heaps topics cover the algorithms. This also includes the algorithm efficiency for run time. Pseudo code and C++ programming language will be used in algorithm implementation. Apart from the theory, the students must apply the data structures and algorithms in the development of small scale application as a group work.

References


BITP 1213 System Development (3,2,2)

Learning Outcomes

At the end of the lesson, students should be able to:
1. Identify and explain all the phases in system development.
2. Follow suitable methodology used in system or application development.
3. Apply system development life cycle based on the current problems.

Synopsis

This course introduces the students to the basic system development concept, analysis, design, modeling, methodology, technique, tool and other perspectives that are important to be considered in the development of information system.

References


BITP 1323 Database (3,2,2)

Learning Outcomes

At the end of the lesson, students should be able to:
1. Identify and explain the concept of database, data modeling (relationship) and SQL statements.
2. Produce data conceptual representation using Entity Relationship Model.
3. Develop database application based on the current problem requirement.

Synopsis

This course is an introduction to database and file management system. It assists the students to form an understanding of data modeling, file management and database system functionality in information system. The students will be introduced to the process of designing, developing and executing database applications. This course focuses on practical skills to create, control and execute statement for database relationship. Exercises based on various resources will be given in all lab sessions. The students will submit their exercises at the end of the lab
session. The students must present their database application project to demonstrate their understanding of the course. This allows the students to apply their knowledge and the techniques that they have learnt into the real world database applications.

References


BITP 2213 Software Engineering (3,2,2)

Learning Outcomes

At the end of the lesson, students should be able to:
1. Explain the concept and importance of requirement engineering in software development process.
2. Implement software requirement phase and analyze the requirement engineering specification.
3. Create official documents for software requirement specification based on the current problems by following the software requirement engineering process.
4. Choose a suitable tool to design a case study.

Synopsis

This course introduces the students to system development and software engineering. The topics includes the software lifecycle, requirement analysis, software design, processes in software design, design quality, strategy in design and metric in software testing. This course also covers software project management including the budgeting and quality management.

References


BITS 1123 Computer Organization and Architecture (3,2,1)

Learning Outcomes

At the end of the lesson, students should be able to:
1. Define and explain computer architecture and organization concept including functional components and their characteristics, performance and the detailed interactions in computer system including system bus, different types of memory and input/output as well as CPU.
2. Apply computer architecture theory to solve the basic functional computer problem.
3. Show and assemble basic computer components.

Synopsis

This course provides detail of computer system’s functional components, their characteristics, performance and interactions including system bus, different types of memory and input/output and CPU, as well as practical implementations of the components. This course also covers the architectural issues such as instruction set program and data types. On top that, the students are
also introduced to the increasingly important area of parallel organization.

References


**BITS 1213 Operating System (3,2,2)**

**Learning Outcomes**

At the end of the course, students should be able to:

1. Explain the major components of an operating system.
2. Elaborate the major operating system responsibilities or aspects.
3. Explain the differences of the functionality among various kinds of operating system.

**Synopsis**

This course gives exposure to the students about the basic of operating system which comprises process, memory management, file and I/O and also CPU scheduling. The introduction part covers the evolution of operating system followed by the basic concepts, technology and theories used in operating system such as concurrency, kernel, deadlock and multithreading.

**References**


**BITS 1313 Data Communication & Networking [3, 2, 2]**

**Learning Outcomes**

At the end of the course, students should be able to:

1. Explain and apply the fundamental concept of data communication and networking.
2. Differentiate types of media, network topologies and network technologies.
3. Practice the best technique in developing network.
4. Configure and troubleshoot a basic network.

**Synopsis**

This course introduces the fundamental concepts and terminology of data communication and networking, encompassing both technical and managerial aspects. It also provides an understanding about the challenges and opportunities faced by the modern businesses. The topics include: fundamentals of telecommunications, data transmission mechanisms, telecommunication media and technologies, considerations for LAN and WAN implementations, the Internet and intranet applications, emerging telecommunications technologies, and trends in the telecommunications industry. Students will also be able to understand, explain and apply the fundamentals of data communication and networking as well as skills in network applications to troubleshoot and configure a basic computer networks using guided or unguided media.

**References**


**BITS 2513 Internet Technology (3,2,2)**

**Learning Outcomes**

Upon completing this subject, students should be able to:

1. Apply the concepts of computer networks, core components of the Internet infrastructure, protocol and services.
2. Show the implementation of client and server application.
3. Select the best Internet application according to the current situation.

**Synopsis**

Internet has become a major tool in doing business today. The evolutions of web based knowledge also contribute to this phenomenon. Hence, this course is purposely designed to provide an introduction to Internet technologies. This course covers a wide range of material about the Internet and the major areas of study including basic concepts of client and server, networking, Internet Security and its application.

**References**


**BITM 1113 Multimedia System (3,2,2)**

**Learning Outcomes**

Upon completing this course, students should be able to:

1. Use several media editing software to create original multimedia content.
2. List down and discuss the software and hardware components used in multimedia system.
3. Demonstrate life long learning by relating and describing the fundamental concept of multimedia systems into other subjects (e.g. Software Engineering, Internet Technology, PSM etc).
4. Apply problem solving skills by identifying several different environments in which multimedia might be used and several different aspects of multimedia that benefit other forms of information presentation.

**Synopsis**

This subject prepares the students with the basic concept of multimedia, technology and the importance of multimedia application. It covers the introduction to media, multimedia graphic implementation, 2D/3D graphics and animation, video, audio, authoring, multimedia integration and application development. In lab sessions, the students will be introduced to tools for selected media elements and authoring software for media integration. Students will be trained for practical preparation of still image, simple animation, sound and effectively apply it in a multimedia project. Students will be exposed to teamwork, leadership, problem solving and communication skills while performing their various tasks and project.

**References**

BITM 2113  Web Application Development (3,2,2)

Learning Outcomes

Upon completing this course, students should be able to:
1. Explain the concept and the principle of Internet and WWW based on the latest technologies.
2. Identify and develop important components in Web applications which comprises client site technology, server site technology, database server and Web server.
3. Relate relevant key components in developing Web applications.

Synopsis

The purpose of this course is to provide the students with a comprehensive understanding of the tools and problem-solving techniques related to the development of effective World Wide Web. It emphasizes on four (4) components of Web application development which are:

- Client Site Technologies: HTML, XHTML, CSS, XML, and JavaScript
- Server Site Technologies: PHP
- Database Server: MySQL
- Web Servers: Apache

References


BITP 3113  Object Oriented Programming (3,2,2)

Learning Outcomes

At the end of the lesson, students should be able to:
1. Apply object oriented programming concept and methods.
2. Build program that implement programming language syntax and semantic in Java application.
3. Develop object oriented application based on the current case study.

Synopsis

This course introduces the students to the object oriented programming methods by using Java programming language. Student will apply and design the basic object oriented structure, swing, event handling, interface components, exception handling, database, multimedia, networking and threads. Student will also develop a complete Java programs and applications.
References


BITI 1113 Artificial Intelligence (3,2,2)

Learning Outcomes

Upon completing this subject, students should be able to:
1. Explain the basic definition of artificial intelligence.
2. Identify the types of artificial intelligence techniques.
3. Use the artificial intelligence techniques in problem solving.

Synopsis

Students will be exposed to the basic and branches of Artificial Intelligence (AI) such as various search techniques, knowledge representation and reasoning, inference techniques, learning from experience and planning. This course also covers some applications of AI including game playing, expert systems, machine learning, and natural language processing.

References


BITU 2913 Workshop I (3,0,9)

Learning Outcomes

Upon completing this course, students should be able to:
1. Use the knowledge learnt specifically the programming techniques to develop a project.
2. Identify and solve problems systematically based on the information from various resources.
3. Run and produce a project individually.
4. Present and defend the project output.

Synopsis

The aim of Workshop 1 is to provide the students with experience and skills to develop and present an individual project. Students must use the knowledge learnt to solve the problems and think creatively to achieve their projects’ objectives and scopes. Students should be able to apply programming technique in their projects. The systems/applications developed must have logic process flow, robust, consistent, have attractive user interface and are able to detect errors in input/output data. At the final stage of this workshop, the students must present and defend their project. A supervisor will supervise the students for the whole 12 weeks and will evaluate the progress during the implementation and final presentation. This course is also a fundamental course to prepare the students for industrial training.

References


BITU 3923  Workshop II (3,0,9)

Learning Outcomes

Upon completing this course, students should be able to:

1. Analyze and develop a group project.
2. Apply the concept of system design and development in their projects.
3. Identify, analyze and organize the changes made to project scope during the project life cycle.
4. Organize a group project with good manner.
5. Present and defend the project output.

Synopsis

This course allows the students to practice their knowledge and experience gained from the courses taken earlier. This course builds the students understanding about problem solving techniques based on their project scopes. The scope of their projects is based on their programme specializations. This course requires the project to be developed in a team of three to five students.

References


BITU 3926  Industrial Training (6,0,6)

Learning Outcomes

Upon completing this course, students should be able to:

1. Be responsible in performing tasks as an ICT worker.
2. Apply skills and knowledge learnt in classes.
3. Practice discipline and ethic in performing daily tasks.
4. Use the latest technology in the ICT domains.
5. Interact and communicate with colleagues in a good manner.

Synopsis

During this course, students will be able to practice the knowledge that they have learnt in UTeM such as analyzing and designing, database programming, data structure and algorithm, operating system, web programming, network and data communication etc. It is an opportunity for the students to gain ICT knowledge as in the industry. The students can develop soft skills and professionalism through interaction and communication with colleagues.

References

Industrial Training Committee "Industrial Training Guidelines", UNIC, Universiti Teknikal Malaysia Melaka.

BITU 3946  Industrial Training Report (6,0,6)

Learning Outcomes

Upon completing this course, students should be able to:

1. Apply the skills and knowledge learnt
2. Use the latest technology in the ICT domain.
3. Organize information to produce a formal report.

Synopsis

This course requires the students to produce a report while undergoing the industrial training. The students should be able to apply the courses that they have learnt at UTeM such as to analyze and design, database programming, data structure and algorithm, operating system, web programming, network and data communication etc. It is an opportunity for them to gain industrial ICT knowledge.

References

Industrial Training Committee "Industrial Training Guidelines", UNIC, Universiti Teknikal Malaysia Melaka.

BITU 3973 Project I [3,0,9]

Learning Outcomes

Upon completing this course, students should be able to:

1. Run testing and validate their systems based on the projects' timeline.
2. Solve problems related to the industrial need in the ICT domain.
3. Complete the project output that has the commercial value.
4. Present and defend the output.
5. Organize information to produce a formal report.

Synopsis

This course joins together all the subjects learnt from year one of the studies including to analyze and to design a specific system, the application of database, algorithm and data structure, web programming, data communication etc. It is compulsory to the final year students to develop a Final Project and to attend the offered courses.

References

1. Bachelor Degree Project and Diploma Project Committee, PSM Report Guideline, FTMK, Universiti Teknikal Malaysia Melaka.
2. Bachelor Degree Project and Diploma Project Committee, PSM Report Guideline Book, FTMK, Universiti Teknikal Malaysia Melaka.

BITU 3983 Project II [3,0,9]

Learning Outcomes

Upon completing this subject, students should be able to:

1. Run testing and validate their system based on the project timeline.
2. Solve problems related to the industrial need in the ICT domain.
3. Complete the project output that has the commercial value.
4. Present and defend the output.
5. Organize information to produce a formal report.

Synopsis

This course joins together all the subjects learnt from year one of the studies including to analyze and to design a specific system, the application of database, algorithm and data structure, web programming, data communication etc. It is compulsory to the final year students to develop a Final Project and to attend the offered courses.

References

1. Bachelor Degree Project and Diploma Project Committee, PSM Report Guideline, FTMK, Universiti Teknikal Malaysia Melaka.
2. Bachelor Degree Project and Diploma Project Committee, PSM Report Guideline Book, FTMK, Universiti Teknikal Malaysia Melaka.
BITS 2313 Local Area Network (3,2,2)

Learning Outcomes

At the end of the course, students should be able to:
1. Explain and elaborate the concepts of local Area
   Network and its usage.
2. Study and identify suitable method in selecting
   hardware, topology and protocol in Local Area
   Network.
3. Demonstrate and configure the software and
   hardware required in Local Area Network
   communication.

Synopsis

This course is an introduction to the current methods and
practices in the use of Local Area Networks (LANs). The emphasis will be placed on LAN hardware and software,
installation management and connection to other networks. The topics include network architecture, network
communication protocol, end-to-end protocol stacks, network components, network management and the (OSI) reference
model.

References

1. Andrew S. Tanenbaum, "Computer Networks", Fourth
2. Todd Lammle, CCNA Cisco Certified Network Associate,
3. Palmer M., Sinclair R.B., Guide to Designing and
   Implementing Local and Wide Area Networks, Second
4. Fred Halsall, "Computer Networking and the Internet",
   Fifth Edition, Addison-Wesley, Pearson Education, 2005,
5. Forouzan, Behrouz. A., Local Area Networks, McGraw-
   Hill Forouzan Networking Series(2003), ISBN 0-07-
   233605-6

BITS 2323 Wide Area Network (3, 2, 2)

Learning Outcomes

At the end of the course, students should be able to:
1. Explain and elaborate the wide area network concept
   and technology.
2. Investigate and identify the suitable method in choosing
   server, wide area network devices and an appropriate
   network technology.
3. Demonstrate the network architecture design with
   using structure design approach to solve wide area
   network problem.

Synopsis

By the end of this course, the students should have an
understanding of concepts, practices, and technologies used
in the design and implementation of Wide Area Networks. The
course covers basic network concepts primarily WAN
 technologies, design processes, network security requirements
and also prepare students to sit for CCNA (Cisco Certified
Network Associates) examination.

References

1. Patrick Regan, Wide Area Network, Pearson
2. Michael A. Gallo, William M. Hancock,
   Computer Communications and Networking
   Technologies, Brooks/Cole, Thomson Learning
3. William Stallings, Data and Computer
   Communications (Sixth Edition), Prentice Hall
   to Networking Essentials (Third Edition) (2003),
5. John E. Canavan, Fundamentals of Network
   58053-176-8
BITS 2333  Network Analysis & Design (3,2,2)

Learning Outcomes
At the end of the course, students should be able to:

1. Explain and elaborate methodology to create computer network effectively.
2. Research and identify the suitable technique to solve the analysis process and design network structure.
3. Design and implement using tool in order to design the network structure to fulfill the user needs.

Synopsis
This subject covers system approach to design the network, concept, guideline and practice to Requirement Analysis and Flow Analysis. Technology options, mechanism and chain management relation and security will be taught in logical design. Several issues in design network will be included in design physical, addressing and routing. Software for analysis and design network such as Microsoft Visio will be introduced and used to help the students understand and apply the network analysis, design area as well as knowledge process.

References

BITS 3313  Network Administration and Management (3,2,2)

Learning Outcomes
At the end of this course, students should be able to:

1. Explain the standards and protocols used for network administration and management.
2. Research and define suitable technique of problem solving in network administration and management.
3. Manipulate the software tools for network administration and management.

Synopsis
This course provide some exposure to the students about the topics in network administration and management, duties as network administrators/managers, host management, infrastructure components, users management, Simple Network Management Protocol (SNMP), Management Information Base (MIB), Remote Monitoring, desktop management, web-based management and network security management.

References

BITS 3323 – Networking Project Management (3,2,2)

Learning Outcomes
Upon completing this subject, students should be able to:

1. Explain and analyze the concept and fundamental theory in network project management including the processes, the tools and the techniques.
2. Research and identify an appropriate method in project management problem solving specifically projects related to networking.
3. Developed project schedule plan relevant to networking using project management software.

Synopsis

This subject covers the structure of project management knowledge that is the project integration management, scope management, time management, cost management, quality management and human management. It also includes processes and steps in project management (project launching, planning, implementation, control and closing or project termination). Software for project management (Microsoft Project and Microsoft Excel) are introduced and used for assisting and applying the enclosure knowledge of project management and its processes.

References


BITS 3513 TCP/IP Programming (3,2,2)

Learning Outcomes

By the end of this subject, students should be able to:
1. Explain and elaborate the concept and theory of basic TCP/IP programming.
4. Define and analyze the legal/ethical issues in computer network security and decides the suitable cyberlaws based on security issues.

Synopsis


References


Synopsis

This subject covers basic and advanced topics related to multimedia networking. Specific topics will be selected from high-speed networks such as: Frame Relay, ATM and High Speed LANs. Special emphasis will be given to multimedia transport protocols (TCP, UDP, RTP, RTCP, RTSP) as well as Quality of Service architectures (IntServ, DiffServ, RSVP, MPLS).

References


BITS 3333 Multimedia Networking (3,2,2)

Learning Outcomes

Upon completing this subject, students should be able to:

1. Explain and elaborate the concepts, multimedia components, standardizations, and applications of Multimedia Networking.
2. Search and identify a suitable technique in Multimedia Networking problem solving approach.
3. Manipulate the mechanisms that support the multimedia application in Multimedia Networking problem solving approach.
ELECTIVE SUBJECTS

BITP 2223  Software Requirement and Design (3,2,2)

Learning Outcomes

At the end of the lesson, students should be able to:
1. Understand and explain about the concept of requirement analysis and software design.
2. Analyze software requirements and design the software using object oriented concept and Unified Modeling Language (UML) notations.
3. Build analysis software requirement models and software design model by using UML notation.
4. Identify and solve problems on software design by using pattern design concept.

Synopsis

This course introduces the students to the concept application software development cycle especially requirement analysis and software design which based on objects, UML notations, difference between OOAD and SDM. It covers requirement analysis modeling besides activity diagram, sequence diagram and class diagram. Design phase will be introduced to students including on how to develop relations between class, operations, attributes, decomposition, frameworks, layers and tiers.

References

3. Cay Horstman, Object Oriented Design and Patterns, John Wiley and Sons 2006
4. Alan Shalloway, James Trott Design Patterns Explained: A New Perspective on Object-Oriented Design, 2/E, Addison-Wesley Professional, 2005

BITM 1123  Media Interactive Authoring (3,2,2)

Learning Outcomes

At the end of the course, students should be able to:
1. Prepare various interactive media applications using the multimedia authoring tools based on industrial requirements.
2. Discuss, report and use a systematic approach in choosing appropriate instructional design to achieve the objectives.
3. Apply interactivity in multimedia application based on the current authoring tools used by the industry.

Synopsis

This subject introduces the students to various stages of interactive media project development; from definition to delivery of a project. The students will also be introduced to the instructional design followed by different stages in the process of developing instruction including prior analysis, design, delivery considerations and later evaluation. The lessons also cover different models in instructional design, e-learning standards and concept of interactivity. The lab sessions consists of the advanced scripting techniques for animation and the usage of Adobe Flash in detail. Students are required to form their own project team in order to produce an interactive multimedia product with appropriate interactivity using Adobe Flash and ActionScript. A complete project and report has to be submitted at the end of the semester.

References


BITM 2123 Digital Audio and Video Technology (3,2,1)

Learning Outcomes

Upon completion of this course, students should be able to:

1. Apply the knowledge and principles of digital audio and video.
2. Apply advanced skills in using audio video software and hardware including the digital media composition techniques to demonstrate the idea and to develop as well as to edit digital audio video products in a group.
3. Choose and organize audio video software and hardware in the conducive production environment with the latest and relevance information.

Synopsis

This course is an extension from Multi media System and Interactive Media Authoring subjects. It gives details and valuable insight of the wonderful world of digital audio and video. Throughout the semester, students will be introduced to topics on audio production, recording techniques, video production tools, video hardware, shooting procedure, special effects, MIDI sequencing, and audio/video production concepts. Besides, various tools for editing, practical as well as composing digital audio and video will be taught during the course.

References


BITS 2213 Network Operating System (3,2,2)

Learning Outcomes

At the end of the course, students should be able to:

1. Explain and elaborate concepts of NOS.
2. Investigate and identify the suitable method of network services depending on the heterogeneous of OS platform.
3. Design the Network Operating System, NOS memory management, and NOS Processing Management.

Synopsis

This subject covers fundamental network administration and system management. Topics include accessing and configuring basic network services, managing directory services, and using network management software on heterogeneous operating system platform. Students should be able to apply system administrator skills in developing a network management strategy.

References

3. Silberschatz, Peterson, and Galvin, Operating System Concepts, Addison-Wesley

**BITS 3533 Wireless Network & Mobile Computing [3, 2, 2]**

**Learning Outcomes**

By the end of this subject, student should be able to:
1. Explain and elaborate the basic concept of wireless theory and access control in wireless network and cellular.
2. Investigate and identify problem related to wireless and access control in wireless network and cellular
3. Demonstrate the three types of wireless operation, risk and threat as well as the method of securing the network.

**Synopsis**

This subject explains the basic knowledge of the concept of mobile and wireless technology via exploring the relationship between hardware, software and development kits. Through lecture, research and application development student will understand the current mobile technology such as J2ME and WAP and also the relationship with operating system and standardization. Student will be exposed to challenges to overcome the hardware shortage of the memory and storage.

**References**


**BITS 3343 Fiber Optic (3,2,2)**

**Learning Outcomes**

Upon completing this subject, students should be able to:
1. Explain and elaborate the concept of fiber optic basic theories.
2. Investigate and identify the suitable cable and network devices for fiber optic.
3. Manipulate the mechanism to support and create the network using fiber optic.

**Synopsis**

This subject covers basic and advanced applications related to optical fiber communication essential. Specific mechanism will be discussed from operating principles of optical communication device to fiber optic communication technology.
References